

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1       1. (Previously Presented) A method of performing a dot  
2 product operation with rounding and shifting in a microprocessor in  
3 response to a single rounding dot product instruction, the method  
4 comprising the steps of:

5              fetching a first pair of elements and a second pair of  
6 elements;

7              forming a first product of the first pair of elements and a  
8 second product of the second pair of elements;

9              combining the first product with the second product to form a  
10 combined product and rounding the combined product to form an  
11 intermediate result via an arithmetic circuit having a first input  
12 receiving said first product, a second input receiving said second  
13 product and a carry input to a mid-position receiving said rounding  
14 value to form the intermediate result; and

15              right shifting the intermediate result a selected amount to  
16 form a final result.

Claims 2 and 3. (Canceled)

1       4. (Previously Presented) The method of Claim 1, wherein the  
2 rounding value is  $2^n$  and the selected shift amount is n+1.

1       5. (Original) The method of Claim 4, wherein n has a fixed  
2 value of fifteen.

Claims 6 to 8. (Canceled)

1       9. (Previously Presented) The method of Claim 1, wherein the  
2 steps of forming the first product and forming the second product  
3 treats a one of the first pair of elements as a signed number value  
4 and treats another one of the first pair of elements as an unsigned  
5 number value.

1       10. (Original) The method of Claim 1, wherein the step of  
2 combining comprises subtracting the product of second pair of  
3 elements from the product of first pair of elements.

1       11. (Original) The method of Claim 1, wherein the step of  
2 combining comprises adding the product of second pair of elements  
3 to the product of first pair of elements.

12. (Canceled)

1       13. (Previously Presented) A digital system having a  
2 microprocessor operable to execute a rounding dot product  
3 instruction, wherein the microprocessor comprises:

4       storage circuitry for holding pairs of elements;

5       a multiply circuit connected to receive a first number of  
6 pairs of elements from the storage circuitry in a first execution  
7 phase of the microprocessor responsive to the dot product  
8 instruction, the multiply circuit comprising a plurality of  
9 multipliers equal to the first number of pairs of elements;

10      an arithmetic circuit having a plurality of inputs each  
11 connected to receive a corresponding one of the plurality of  
12 products from the plurality of multipliers and a mid-position carry  
13 input for mid-position rounding responsive to the rounding dot  
14 product instruction; and

15        a shifter connected to receive an output of the arithmetic  
16 circuit, the shifter operable to shift a selected amount in  
17 response to the rounding dot product instructions.

Claims 14 and 15. (Canceled)

1        16. (Currently Amended) The method of Claim 1, wherein:  
2            the step of shifting further includes sign extending the  
3 intermediate result.

1        17. (New) The digital system of Claim 13, wherein:  
2            the shifter right shifts the output of the arithmetic circuit  
3 by the selected amount and sign extends the output of the  
4 arithmetic circuit.

18 to 24. (Canceled)